stern of a vessel. The former is the case generally observed at Helena and other famous foehn stations in Montana; the latter case is that of Green Mountain and of Table Bay when south and southwest winds blow over Table Mountain and the Lion's Rump.

Undoubtedly, the same phenomenon must be observed in every similar combination of conditions the world over, and precisely these were present on the date quoted by La Pérouse in whose case, as the center of low pressure passed over him, the easterly winds veered quickly to the south and then to the west and north, and descended upon him from the mountains a few miles to the northwest.

BAROMETRIC TIDES.

Passing by the many observations on storms and fogs contained in the second volume of the English edition, we come to the last article in the appendix describing observations made to discover the flux and reflux of the atmosphere. This article by Mr. de Lamanon is dated from St. Catherines, November 5, 1785, and embodies observations made hourly from September 28 to October 1, when the vessel was sailing in a southwesterly course, between latitude 1° 5′ N. and 1° 34′ S., and therefore near the equator. Observations of this character had been recommended by the Academy as being most likely to reveal the slight tidal influence that the moon might exert on the earth's atmosphere. De Lamanon found that the tide at the equator amounted to a variation in the barometric pressure of about 0.12 English inch, which is equivalent to a rise and fall of about 100 feet. This result was sufficient to show the extreme delicacy of the problem, which has, since then, been so abundantly investigated, but still remains one of the mysteries of meteorology.

The following are the exact words of De Lamanon's report:

THE FLUX AND REFLUX OF THE ATMOSPHERE.

By G. DE LAMANON (from La Pérouse, Vol. II, p. 521).

Having been present at the reading of this article [the Instructions—ED.] in an extraordinary sitting of the Academy, I caused an excellent barometer to be constructed by the Sieur Fortin, so as to show a variation of $\frac{1}{50}$ of a line. This ingenious artist was recommended to me by M. Lavoisier. It was supposed I should make use of this instrument, constructed for the above purpose, and it was for this reason the Academy, in its instructions, recommends that the observations should be made on shore; but having procured at Brest a marine barometer, made by Nairne, and described in the voyage of the celebrated Cook, I found that it was perfectly calculated for making exact observations even at sea. However great may have been the rolling of the vessel, the mercury has hitherto remained immovable, owing to the excellent suspension of the barometer and to the capillary tube, which is fitted to the common tube, and by the help of the nonius, which is added to it, variations so small as $\frac{1}{10}$ of a line may be readily perceived.

By observing this barometer daily, at sunrise, at noon, and at sunset, I remarked that, from the latitude of 11° 2′ north to that of 1° 17′ north, its movement was extremely regular. It was always at its maximum of elevation about noon, when it descended till the evening, and rose during the night.

We reached the latitude of 1° 17′ north on the 27th of September, and on the 28th, before daybreak, I began a series of observations, for which I had made preparations the evening before, and I continued them every hour till the 1st of October, at 6 o'clock in the morning; that is, for a period of upwards of three days and three nights. During the six hours that I devoted to sleep, M. Monge was so good as to supply my place. I thought it necessary at the same time to observe the thermometer in the open air as well as that attached to the barometer, and the hair hygrometer. I marked down, also, in separate columns, the direction of the wind, the course of the ship, and the rate of our sailing, estimated by the log, and embraced the same opportunity of observing the temperature of the sea and the dip of the needle.

The results of these observations appear to me to be extremely curious. The barometer gradually ascended for six hours, and then descended during the next six, and continued thus alternately rising and falling, as may be seen by the following table, extracted from my journal. [The table is omitted.—ED.]

The flux and reflux of the air at the equator is accordingly so great as to cause a variation in the barometer of about one line and $\frac{2}{10}$ of the English division, which supposes a rise and fall in the atmosphere of about a hundred feet; while the combined action of the sun and moon, according to M. Bernoulli, causes an elevation in the sea at the equator of only seven feet.

It is true, there are corrections to be made, first, for the difference in the temperature of the mercury in the barometer; secondly, for the difference that may exist in the temperature of the air; and lastly, for the seven feet rise and fall of the sea, on which I was placed when making observations.

I must leave it, however, to more able philosophers than myself to determine whether or not this be agreeable to theory and calculation. But, be it as it may, it is evident from the observations, that meteorologists allow far too much to the action of the moon, as I hinted in my observations on the fog of 1783, printed in the Journal de Physique, and which M. de la Place, author of La Cosmographie Elementaire, has mathematically demonstrated. It would, nevertheless, be equally erroneous to count as nothing the action of the moon; since by causing a variation of one line and $\frac{3}{10}$ in the barometer, it may influence the atmosphere and occasion sensible alterations.

As I think it my duty to lay my observations before the Academy in the state in which they were made, I here subjoin them. It should be remembered, however, that the change of level in the reservoir of the barometer requires a line to be added to the different heights of the mercury marked in the table. [Table omitted.—ED.]

NOTES FROM THE VOYAGE OF LANGSDORFF.

Mr. O. J. Klotz also furnishes the following note:

A singular phenomenon is noted by Langsdorff in his Voyage and Travels, 1803–1807, Part II, p. 219, latitude 39° 49′, longitude 133°: "The current of the wind at different heights in the air was very disproportionate; the sea was perfectly calm and almost as smooth as glass, and the lower sails hung totally loose while the upper were so filled with wind that by means of them alone we ran at the rate of 6 miles an hour."

NOTES FROM THE SEPTEMBER REPORTS OF THE CLIMATE AND CROP SECTIONS.[1]

ARIZONA.

The weather was remarkably cloudless during the month. Mr. Leopold Walloth reports that a deep thundering noise was heard between noon and 1 p. m, September 12, proceeding from the Granite Range, between his station (Yarnell) and Prescott, both of which are in Yavapai County. He adds that from all accounts a large meteor struck the earth at this time.

It is often difficult to distinguish between the noise and concussion due to an earthquake and that due to a meteor rushing through the atmosphere, and as both of these occur frequently, either one is a plausible hypothesis in connection with the Arizona phenomenon. But it is entirely improbable—as for that matter, impossible—that the noise heard at Yarnell could have been due to the striking of a meteor against the ground in the neighborhood of the Granite Range. Whenever, as has happened in a few cases, any one has actually been near enough to observe a meteoric stone fall to the ground, a noise has, indeed, been heard proceeding from the air as the meteor rushes through it, but nothing remarkable has been recorded relative to the noise made when the meteor actually strikes the ground. In fact, a cannon ball roaring through the air over one's head, makes very little noise when it finally buries itself in the earth. The noise heard at Yarnell could easily have been produced by a meteor rushing through the air, but not by one when it struck the ground. It occurs to us, however, to remark that these deep thundering noises in hilly and mountainous countries, are sometimes produced by landslides on the surface and sometimes by the cracking apart of great masses of rock long before the visible landslide occurs. In the interest of science it is desirable that such noises should be traced back to their true origin and cause; one should not be satisfied with the popular idea that, *perhaps*, a large meteor struck the earth, for this latter is among the rarest of observed phenomena.

We are pleased to note that the Agricultural Association of

[1] These were prepared for the September REVIEW but were necessarily postponed.

Arizona, which will meet October 21, is to be addressed on the subject of climatology by W. G. Burns, Section Director for that State. It is very important that the section directors and other officials of the Weather Bureau should not fail, on all occasions, to lay the importance of this subject before the people in popular addresses and plain farmers' talks. We are not yet prepared to state definitely the exact influence of climate on crops, as distinguished from that of soil, seed, cultivation, etc., but the subject is worthy of the most profound investigation, for we can not have a crop without having the climate necessary to produce that crop.

COLORADO.

The report from Colorado shows the presence of extensive forest fires, beginning at least as early as the 5th, in the central and northwest counties of the State. As these continued late into the month of October, and were spread by the high winds and favored drought and excessive heat, they constitute an important feature in the climatology of these months.

GEORGIA.

Mr. Marbury, section director, answers a correspondent explaining why the wind sometimes shifts by veering around from north to east, etc., and why at other times it shifts by backing from east to north, etc. As many others may desire the same explanation, we repeat his words, which are quite in accord with experience throughout the whole Northern Hemisphere.

The changes in the direction of the wind depend upon the position and movement of the areas of high and low pressure. In crossing the United States these areas generally move from a westerly position toward the east or northeast. The question whether the wind will back or veer depends upon whether the center of low pressure or the center of high pressure shall pass to the north or south of the station.

INDIANA.

A well defined aurora was observed at Topeka, Lagrange County, on the night of the 2d. This is the first report received relative to the auroras that occurred during the presence of the great sun-spot which will probably be described elsewhere in the "Notes by the Editor."

IOWA.

Mr. John R. Sage, director, points out the crude character of the reports of actual crop returns. He says:

In Iowa the normal or average yield of corn for the past fifteen or twenty years has been 32 or 33 bushels to the acre. Why should not the rating, 100 per cent, be made to represent this normal yield of the crop? But the larger number of crop reporters assume that 100 per cent represents 40 to 45 bushels per acre. Mr. James Patterson, of Cedar County, adopts 65 bushels as the normal crop per acre, whereas it is really the maximum crop under the most favorable circumstances. The crop reporters of Iowa were, on September 1, asked to state their individual estimates of the average yield. The result showed that the reporters use a high standard, such that 34 bushels per acre is 86 per cent of the standard; therefore the latter would be about 40 bushels per acre. Iowa has a complete system of State reporters independent of those that report to the statistical division of the Department of Agriculture.

These two classes of reporters do not differ widely in their estimates of prospective yield per acre, expressed in bushels, but when expressed in percentages of the standard or normal crop, they differ widely, as no two have the same standard. As to the final output of corn this season, we must await the verdict of the huskers, as they will express it in measured bushels per acre.

The observer at Alta, Mr. David E. Hadden, reports that on the 2d a low, flat, but bright aurora was observed.

KENTUCKY.

The section director, Mr. George E. Hunt, states that "On the 29th, about 5 p. m., a very severe local storm passed over the eastern portion of the city of Louisville, moving from southwest to northeast, blowing down trees and lifting roofs."

An examination was made along the track of the storm which demonstrated that it was a severe wind storm blowing straight ahead in gusts, and not a tornado; it lacked all the distinctive features of the latter. There are undoubtedly many so-called tornadoes that are truly straight-line gusts, and yet if we take a comprehensive view we can always find a low area and a high area to which these gusts may be associated. In the present case there was a low in Kansas and Nebraska, another on the coast of Texas, and another in Manitoba. These were special points in an extensive area of low pressure toward which both the lower clouds and surface winds were flowing. Under such conditions masses of the upper or cloudy air occasionally descend to the earth's surface, rushing along with a small fraction of the speed due to falling masses, and although they constitute at first a straight-line gust, yet after a few miles of this rapid progress they may soon subside altogether. Now, a mass of air can not descend without the equal ascent of a corresponding mass, and this latter, as it cools by ascension, becomes a cumulus cloud; therefore, the straight-line gust at the ground usually has a cloud above it or in close connection with it. Under favorable circumstances this cloud may develope into a thunderstorm or a tornado, but the original straight-line gust was not a tornado. The latter, like the waterspout, originates in a cloud and grows downward, although the individual particles of air are rapidly ascending.

LOUISIANA.

This is the second number that has been published under the editorship of Mr. Alexander McAdie, local forecast official and section director, who has recently succeeded to the charge of the station at New Orleans. Mr. McAdie summarizes the results of experience of the Horticultural Club of Riverside, Cal., relative to the protection of citrus fruits during frost. He says:

The results of a large number of experiments carefully made and checked were:

1. That the temperature of orchards can be materially raised by dry heat.
2. That the radiation of the earth's heat can be materially lessened by moist smudges started early and properly managed.
3. That raising the dew-point by means of steam-producing devices was not successful. (Note.—It is proper to state that while this may be true for one locality, it may not be true for other localities where climatic conditions are very different.)
4. Cloth and mat coverings were found to be effective, but are thought to be too expensive.
5. The temperature was invariably higher in old seedling groves, or where tall windbreaks afford to smaller fruit trees a like protection, than in exposed orchards. A tall well-located windbreak is an advantage, but one not properly located may prove to be a disadvantage.
6. The temperature, 20 feet above the ground, was 1° to 2° higher than at the surface; at the height of 50 feet the temperature was from 5° to 10° higher than at the surface when the air was still. When the air was in motion, the difference was slight.
7. Coal baskets, sufficiently numerous, proved the most efficient protectors. Oil pots make a hotter fire, but the deposit of lampblack upon the tree and fruit is objectionable.

The whole report of the committee is of the greatest interest, and should be read by all fruit growers. For orange and lemon growers, it is most valuable, as it shows the cost per acre of effective protection.

MINNESOTA.

Mr. Outram, section director, quoting from an exchange, says:

The principal need of all fruits is plenty of water with good drainage to carry off the surplus water in the soil, when it shall happen that a surplus exists. Mr. Hale, of Connecticut, has done much to advance irrigation of fruits in the East, and meantime the importance of arranging to furnish fruit plantations with a full supply of water is being discussed in the West and South.

Fruits are largely water, and can only reach perfection in size when they have water enough to enable them to perfect their growth. There are no crops that take so little from the soil as fruit crops. They are made up of water which is plentiful if pains are taken to get it, and sunshine and air, which comes to us without cost.

On several occasions during the past year the Editor has called attention to the fact that in the Atlantic States the evil effects of droughts can be counteracted by irrigation just as successfully as in the arid regions of the West. The above-quoted article states some of the results of irrigation in Nebraska and Iowa, thus: the yield of currants to the acre increases from 100 to 275 bushels, or 8,800 quarts; the raspberry yields 2,000 or 2,500 quarts; the blackberry, 3,000 or 4,000 quarts; strawberries, cherries, and grapes bear enormous crops of the finest fruits. At Vineland, N. J., a gasoline engine of 2½-horse power pumps enough water to irrigate 20 acres. Irrigation in the East and in the West alike will repay both the horticulturist and the planter. We have already stated that droughts of 3 months' duration are liable to occur once in a century anywhere in the Middle or Eastern States, and it behooves the farmer to be prepared for such a disaster.

MONTANA.

A. B. Coe reports from Kipp, in Teton County, at an elevation of 4,472 feet:

Wonderful aurora on the evening of the 11th. Position 30° southwest of the zenith. Repeated on the 12th in the same position.

These dates were fair weather days midway between the rains of the first and last weeks of the month.

NEBRASKA.

Mr. Loveland gives a summary of investigations that have been made on the loss of water from reservoirs by seepage and evaporation at the agricultural experiment station. We shall return to this subject at some future time, but the following figures will be of general interest.

Losses from seepage depend upon the condition of the soil at the reservoir, and may be less than from evaporation alone. A loss of about 2 feet in depth per year over the area of the lake at Fort Collins, Nebr., has been measured. If the loss from seepage is not more than 2 feet per annum, the reservoir may be considered practically water-tight. This same amount is often lost in twenty-four hours in the case of irrigation canals.

For well-built reservoirs and canals the loss from evaporation is often greater than from seepage. It increases with the temperature of the water and strength of the wind and diminishes as the atmospheric humidity increases. The annual evaporation from the standard tank at Fort Collins has averaged 41 inches per annum during the past eleven years. When the water is frozen evaporation is slower and averages 1 or 1½ inches per month. The evaporation at night is the same as during the day. The loss by evaporation from several lakes averaged about 60 inches per annum, being greater than that from the standard tank, due to the higher temperature of the water and freer exposure to the winds. The diminution of barometric pressure tends to increase the evaporation. At 8,000 feet the evaporation is 14 per cent more than at 5,000, and at 10,000 feet it is 18 per cent more. For every increase of 1 mile in the wind movement in twenty-four hours the evaporation increases by from 1 to 2 per cent over that when there is no wind. Evaporation is lessened by any influence that diminishes the wind or lowers the temperature of the water. The deeper the lake the cooler the water as a whole; consequently the surface is cooler and the evaporation is less. The annual loss of depth of water by evaporation may be assumed at 4 feet and that by seepage 2 feet; consequently the combined loss is 6 feet. The net loss is this depth diminished by the rainfall.

NEW ENGLAND.

Mr. J. W. Smith notes that great smokiness prevailed over most of New England on the 19th and 20th, the odor of the smoke being plainly noticeable. The smoke soon disappeared with a brisk northwest wind. It would be an instructive and curious computation to figure out how much wood was burned in the great forest fires in Colorado and how much this must have affected the meteorology of the globe.

NEW JERSEY.

Again, this State has been visited by a most destructive storm of rain and wind. According to Mr. McGann, section director, the storm was first felt in the vicinity of Pottsville, Schuylkill County, Pa., whence it swept down toward Trenton. Pottsville is about 80 miles west-northwest from Trenton, with several ranges of mountains between, and as this is rather a long path for a single thunderstorm among the mountains of Pennsyvania, we hope that a careful study of this storm will be made by some one who has the data conveniently at hand. Not only was the storm felt at Trenton, but also, especially, at Elizabeth, N. J., and eastward on Staten Island Sound. One can hardly doubt that we have here a case of a descending mass of air rushing southeastward over the ground, spreading a little to the right and left, on its way from the highlands of Pennsylvania to the Atlantic seaboard. The rising air pushed up in front of that which flowed gently but steadily from the northwest was the seat of the formation of cloud, rain, hail, lightning, and thunder. The Weather Maps for September 7 and 8 show that the whole Appalachian region was overflowed by a mass of cold air moving from the northwest producing similar rains and storms throughout the Atlantic States. Everywhere rain was reported on the 7th and 8th from New England to Georgia, but nowhere do the cloud conditions appear to have been so favorable for the formation of violent rain and wind as in this central portion of New Jersey. This is another illustration of the fact mentioned in commenting on the storm of the 29th, at Louisville, Ky., namely, that descending winds rolling along the earth's surface may subside altogether unless the conditions in the clouds just above them favor the development of more violent disturbances. This present storm was not a tornado nor a cyclone, still less a hurricane, as it is called in this report. It was simply a high wind and a violent thunderstorm.

NORTH CAROLINA.

The rains of the 7th and 8th mentioned in the preceding paragraph were quite prominent throughout North Carolina, but were overshadowed by the remarkable rainstorm of September 22. Concerning this storm, Mr. C. F. von Herrmann, section director, says:

The storm of September 22, in western North Carolina affords a very remarkable illustration of the effectiveness of a mountain range in increasing the rainfall under suitable conditions. On that morning an extensive area of high barometer existed on the middle Atlantic coast, causing fresh easterly winds over the entire State. The mountains of western North Carolina afford the highest land east of the Rockies, and the crest of the Blue Ridge extends from northeast to southwest in a curved line over the State in such a way as to form a trap or bay into which the easterly winds were blown with considerable force and deflected upward over the crest of the mountains. The downpour of water in the course of twenty-four hours was exceptionally heavy over the country immediately east of the Blue Ridge; but as we pass farther east or west of the crest of the ridge there was a rapid diminution in the rainfall; unquestionably the air over the eastern part of North Carolina must have been nearly saturated with moisture but the ascensional tendency and the dynamic cooling were absent except near the crest of the ridge. The rainfall on the southern slope were not so heavy as that on the eastern slope. Disastrous freshets were produced in the Catawba and Yadkin rivers.

The contrast in rainfall and its relation to the wind is shown by the following figures.

At some distance to the east of the mountain the following figures were reported:

Charlotte, 1.82; Mocksville, 1.53; Saxon, 3.88; less figures were reported still farther east.

On the west side of the mountains the reports were:

Waynesville, 1.70; Asheville, 2.72; Knoxville, 1.08 for the entire storm.

On the immediate eastern slope of the ridge the rainfall and prevailing winds were as follows:

	Rainfall.	Wind.		Rainfall.	Wind.
	Ins			*Ins.*	
Saxon, Stokes Co	3.88	ne.	Linville, Mitchell Co.*.....	7.57	se.
Mountairy, Surry Co.....	6.02	.....	Marion, McDowell Co.....	6.78	e.
Ashers, Wilkes Co.....	7.01	se.	Morgantown, Burke Co.....	4.77	.....
Paterson, Caldwell Co...	8.00	e.	Skyuka, Polk Co....	5.61	se.
Lenoir, Caldwell Co.....	6.00	se.	Flatrock, Henderson Co.†...	5.75	.....

*On the crest of the Blue Ridge. †Near the crest of the Blue Ridge.

PENNSYLVANIA.

No special mention is made of the thunderstorm that passed from Pottsville to Trenton on the 7th, according to the New Jersey section report. It is very desirable that the severe thunderstorms that proverbially trouble New Jersey and the city of New York should be traced to their origin in the mountains of Pennsylvania. Probably this could be effected by a little special cooperation between the three section directors. It would seem as though New York City and New Jersey should, from this point of view, be studied in combination with eastern Pennsylvania as a special field for the development of thunderstorms. The prediction of such storms, even for a few hours in advance, could be made of the greatest value to a large number of people in Philadelphia and New York.

TENNESSEE.

The advancing mass of cold air that gave the Atlantic States their rains on the 7th and 8th is chronicled as a norther at Bolivar, Tenn., and in fact low temperatures and frosts prevailed extensively on the morning of the 8th. This reminds us that in 1871, in October and November, as the season approached for northers in the Gulf States, and we were about to experience our first efforts at their prediction, the Editor had occasion to announce as the result of considerable study of the descriptions of northers of Texas and the Gulf, that they must be considered as the advancing front of a shallow layer of cold air flowing from the upper Missouri valley southward to the Gulf. Therefore, they constitute the southern borders of the areas of high pressure and cold, dry, clear air. The first description and predictions of a norther in the Gulf of Mexico, November 28, 1871, was made in accordance with this view.

WISCONSIN.

The observer at Manitowoc records a zodiacal light appearing in the west between 8 and 9 p. m. on the 12th, at an altitude of 15°. Could this have been an auroral streamer, many of which were observed this month? In general the aurora is distinguishable from the zodiacal light by its oscillations in brightness and location and by the manner in which the light is distributed over the beam. Auroral streamers generally have quite sharply-defined edges and uniform brightness, whereas the zodiacal light has ill-defined edges and is brightest along its central axis. Regular observers of zodiacal light are much wanted by the astronomers, and those who contemplate such work should study the writings of Searle and others.

WYOMING.

The September report from this section contains the first official publication relative to the convention of Weather Bureau officials held at Omaha on the 13th and 14th of October. Section Director W. Palmer was present, and we believe that all will echo his statement—

That a very enthusiastic and profitable meeting was held. The Chief of the Weather Bureau was present and presided at the convention and the banquet.

LIGHTNING ON WIRE FENCES.

A correspondent of the Iowa Weather and Crop Service inquires of Mr. Sage how to construct wire fences so as to protect stock from the deadly effects of lightning that is frequently conducted many yards along the fences. Mr. Sage repllies in the Iowa Monthly Review for October, 1898, that so-called ground wires should be built into the wire fences.

A ground wire to be effective should have contact with every wire on the fence, and should enter the ground far enough to reach moist earth, or at least two feet below the bottom of the fence post; the deeper the better. In the construction of a fence the wires may be most easily sunken to the required depth in the bottoms of the post holes, before the posts are set, by the aid of a slender bar or pointed rod of steel. The contact with the fence wires may be made on the posts, and it would be well to have the ground wires long enough to allow the points to be elevated a few inches above the posts, serving as lightning rods. A good ground wire attached in this manner to every fourth post, where the posts are set a rod apart, ought to afford a large measure of protection. The cost of wire is trifling, and if the ground wires were placed two rods apart the expense of the labor and material would not be burdensome.

THE UTILIZATION OF FOG.

Mr. Herbert Earlscliffe of Santa Barbara, Cal., has communicated to the Weather Bureau, through the Chamber of Commerce of Los Angeles, a suggeston relative to fog that should call forth all the inventive genius of America. Mr. Earlscliffe says:

In California there are vast areas of valuable land where the water supply is insufficient. Nature has endeavored to correct this by sending in heavy fogs laden with moisture, and it only remains for the ingenuity of man to utilize this. These fogs generally come in from the ocean at night during the dry summer months, when most needed, but are dissipated early in the morning by the sun. Here is ample moisture brought to our very doors if we could but discover some simple and practical method of condensing or precipitating it on a large scale.

It certainly is tantalizing to think of this immense quantity of moisture present and visible but unavailable. Neither science nor art, at present, can suggest any feasible method of causing this fog to descend in refreshing drops of rain. On the other hand, the green vegetation at the summits of many mountains has often been observed to be due essentially to cloud or fog and not to rain; it may, therefore, be hoped that along the coast of California some device will soon be introduced that shall catch the fog particles as they float along and force them to trickle down in gentle streams of water so as to moisten the earth. We do not propose to condense or precipitate the atmospheric moisture in the ordinary sense of those words, but simply to catch it as the leaves of the trees do. We recall the so-called drip from every rock and twig on the summit of Table Mountain at Cape Town, and especially on the summit of Green Mountain in the Island of Ascension and the dampness of the rocks on Pikes Peak, and we can not doubt but that in many spots throughout the globe, vegetation is kept alive by the small amount of moisture that is caught on the leaves, and dripping thence to the ground is soaked up by the roots of the plant. In fact, there are several plants whose leaves and branches are so arranged as to facilitate drip and the collection of moisture by this process. What is needed by the agriculturist on the California coast is some simple mechanical arrangement by which the quantity of fog particles shall be intercepted as they flow past any given plant, and shall be forced to drip or glide downward into the ground at the root of the plant. Any fan-shaped arrangement of sticks or slats that increases the area exposed to the fog should apparently increase the quantity of moisture carried down to the roots. Mechanical devices, the explosion of dynamite, refrigerating apparatus and other analogous devices are likely to be too expensive in comparison with the return they make.